CLAIMS

1. A sensor comprising a mechanical resonator (10) including an element (11; 18; 123) of which the stiffness at least partially determines a modal shape of the resonance of the resonator and means (21-23) for measuring a variation of a measure of the resonance as the stiffness of said element changes.

2. A sensor according to claim 1 wherein the resonator (10) comprises two beams (10a, 10b; 120, 121) connected by at least said element.

3. A sensor according to claim 2 wherein said beams are connected at or near one end by a yoke (12; 122) which provides a clamped condition of the resonator at said one end and are connected at or near another end by said element.

4. A sensor according to claim 3 wherein the resonator including said beams includes a box section disposed to increase the sensitivity of the resonator to changes in thickness of said element.

5. A sensor according to ~~any foregoing~~ claim 1 wherein said means for measuring (21-23) includes at least two sensing transducers of which one is located at or near a node of the resonance and provides a reference signal.

6. A method of sensing comprising measuring variation of amplitude or phase or frequency of a part of a resonator as a result of a change in modal shape of the resonator caused by a change in stiffness of an element forming part of or coupled to the resonator.

7. A method of sensing according to claim 5 and employed to detect the depletion or building of said element.

8. A method according to claim 5 and employed to measure the viscosity of a fluid.

9. A method according to claim 5 and employed to measure the viscoelasticity of a solid or

fluid.

10. A method according to claim 5 and employed to measure force from a change in modal shape of the resonator.